

(No Model.)

R. P. SHACKELFORD.

WATER GRATE FOR FURNACES.

No. 305,480.

Patented Sept. 23, 1884.

FIG. 1.

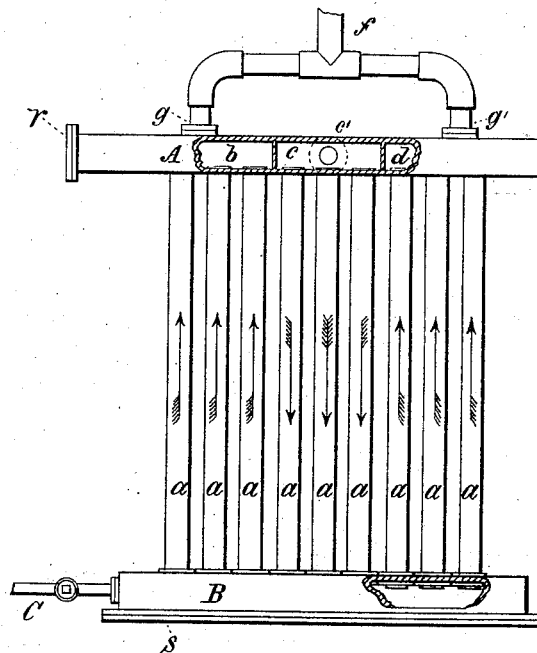


FIG. 2.

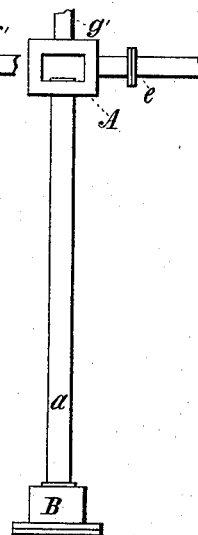
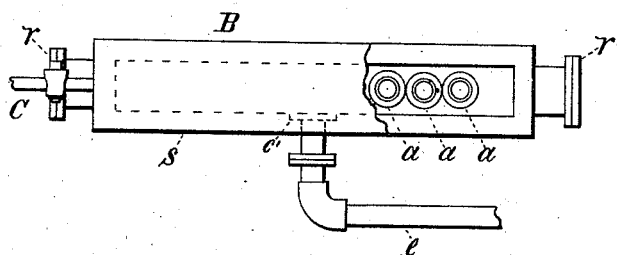


FIG. 3.



WITNESSES.

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RICHARD P. SHACKELFORD, OF JERSEYVILLE, ILLINOIS.

WATER-GRATE FOR FURNACES.

SPECIFICATION forming part of Letters Patent No. 305,480, dated September 23, 1884.

Application filed January 25, 1884. (No model.)

To all whom it may concern:

Be it known that I, RICHARD P. SHACKELFORD, of Jerseyville, in the county of Jersey and State of Illinois, have invented a new and
5 Improved Water-Grate for Furnaces; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

10 My invention relates to an improvement in water-grates for furnaces, and is of that class provided with hollow grate-bars, through which a current of water is made to flow for the double purpose of heating the water and
15 preventing the grate-bars from becoming injuriously hot.

The object of my invention is to provide means whereby the inflowing water is made to circulate more advantageously than heretofore through all the grate-bars. This I accomplish by certain details of construction, fully explained hereinafter.

In the drawings, Figure 1 is a plan view of the grate, showing the inlet and outlet pipes.
25 Fig. 3 is a front end elevation of the same, showing part of the door of the front water-chamber broken away in order to exhibit the interior part thereof. Fig. 2 is a side elevation of the grate, showing a portion of the inlet and outlet pipes.

30 In Fig. 1, *a a*, &c., represent a series of tubular fire-bars communicating at their rear ends with a water-chamber, A, a portion of which is exhibited as broken away to show
35 the interior, which is divided into three separate compartments, *b*, *c*, and *d*, *c* being an inlet-compartment, and *b* and *d* outlet-compartment. The front ends of said tubular fire-bars communicate with an undivided water-chamber, B, situated directly below the furnace-door, and is preferably provided with a blow-off pipe, C. The central compartment,
40 *c*, of the chamber A is provided with an inlet-pipe, *e*, the two outer compartments *b* and *d* being furnished with outlet-pipes *g g'*, united by a T-pipe, *f*, the latter designed to convey the hot water where required. It will be noticed that chamber B is provided with a removable door, *s*, and also that chamber A

is provided with removable doors *r r'*, one at each end. The use of these doors is to afford
50 easy access to the interior of the tubular grate-bars, for the purpose of removing by means of an ordinary tube-scraper or otherwise the incrustation with which the interior
55 surfaces of bars of this class soon become coated, also for the purpose of cleaning the chambers themselves, access to the middle compartment, *c*, of the chamber A being provided for by the removal from the under side
60 of the large flange *c'* of the inlet-pipe *e*. The tubular fire-bars are preferably secured in the side of the chamber A by being screwed into threaded holes provided for their reception, the opposite ends being secured in corresponding unthreaded holes in the inner side
65 of the water-chamber B by means of inside and outside nuts, as shown in Fig. 1.

The action of my device is thus: The cold water, being admitted by the inlet-pipe *e* to the central compartment, *c*, of the water-chamber A, flows, as indicated by the arrows, through
70 that part of the grate which is subject to the greatest intensity of heat—namely, the central part—into the chamber B, and then returns
75 through the bars on either side to the compartments *b* and *d*, whence it is driven through the T-pipe *f* to wherever required.

I am well aware that water-grates are not new, and therefore do not broadly claim such; 80 but

What I do claim as my invention, and desire to secure by Letters Patent, is—

In a water-grate for furnaces, the tubular bars *a a*, in combination with water-cham-
85 bers A and B, the chamber B divided into compartments *b*, *c*, and *d*, the two former, *b* and *c*, provided with outlet-pipes *g g'*, and the latter, *d*, provided with an inlet-pipe, *e*, substantially as and for the purpose herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand and seal this 14th day of January, 1884.

RICHARD P. SHACKELFORD. [L. s.]

Witnesses:

JOHN C. CUMMING,
ANNA SPENCER.